Quarantine in the school!

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The school is in uproar! …Or at least the nurse’s office is a bit fuller than usual. The principal is concerned but doesn’t want to pull in any higher authorities until he is absolutely certain we have an outbreak on our hands. Since the nurse is busy taking care of students until their parents can pick them up (and not necessarily skilled in diagnosing as much as nursing), the biology class has been enlisted to take a preliminary look as a last resort.

What we’ll need to do:

* Decide which students have the same disease
* Find the commonalities between the cases to pinpoint a link between them
* Cite a possible source of the disease
* Analyze the samples to find discrepancies
* See if any potential causes of the disease can be cured with antibiotics

What you will be given:

* Statements from the ill students including
  + Signs and symptoms
  + What they ate that day
* Fecal samples to study
* Microscope
* Mask and gloves

Prior to beginning your investigation, consider the following:

1. About 200 students out of the official school population of 2,000 have reported feeling ill. Does this constitute as an outbreak? Why or why not?

2. What if only about 100 of those students have similar symptoms?

**Part A**

In the interest of patient privacy, no names will be disclosed. Otherwise, take a look at some entries from the nurse’s log. Decide who among them have the same sickness.

Student 1

Symptoms and signs:

What they ate:

Student 2

Symptoms and signs:

What they ate:

Student 3

Symptoms and signs:

What they ate:

Student 4

Symptoms and signs:

What they ate:

Student 5

Symptoms and signs:

What they ate:

Student 6

Symptoms and signs:

What they ate:

Student 7

Symptoms and signs:

What they ate:

Student 8

Symptoms and signs:

What they ate:

What are the signs and symptoms of the potential outbreak disease?

How many students have the disease?

What do they have in common? Is there any correlation between grade, lunch period, gender?

Where is the possible source of the disease?

**Part B**

It appears that something might be going on, but we need to be able to give as much information to the higher-ups as possible. The principal has always been a bit of an eccentric, so we actually have stool samples from some of the students. We all know better than to ask the principal certain questions.

\*\*\*Make sure that you wear your masks and gloves, especially since we’re not entirely certain how it might spread yet.

From your nurse log sheet, pick a sick individual and an individual without the disease. Talk to your instructor to obtain samples from these individuals.

You have dissecting microscopes, probes, and tweezers to inspect your samples.

Draw and describe your sample. Especially note any differences between the two.

Sample from student \_\_\_\_\_\_\_\_

Sample from student \_\_\_\_\_\_\_\_

What differences did you find?

**Part C**

Using what you’ve isolated from the student stool samples, we must now determine if it is alive. Why? Because the biochemistry classes have been roped into the cause, too: they have engineered a potential antibiotic.

1. Take a small portion of your infected sample and place it in a beaker.
2. Write down your initial observation, including from which individual your sample came from.
3. Add approximately 75mls of warm (not hot) water and one packet of sugar.
4. Write down your observations.

Initial observation:

With water and sugar:

With water and sugar after 1 minute:

With water and sugar after 3 minutes:

With water and sugar after 7 minutes:

Do you feel that your supposed infectious agent is alive? Why or why not?

What are the different qualities necessary to show an organism is alive?

Why is it important for the suspected cause of the disease to be alive before we administer an antibiotic?

What are some of the living and non-living causes of disease?

\*\*\*All fecal samples and gloves should be disposed of in the biohazard bags. All tools should be sanitized prior to returning.

**Part D**

You and your partner may join another group.

Were you in charge of the investigation and assuring the continuing health of the remaining students, how would you design the quarantine protocols? Where did the disease come from? How does it spread? How could it be contained?

(Need some guidance? <http://www.cdc.gov/excite/classroom/outbreak/steps.htm>)